

### Claims

We Claim:

1. A method of determining % N-glycolylneuraminic acid (Neu5Gc) of a biological material comprising the steps of:
  - (a) measuring the amount of N-acetylneuraminic acid (Neu5Ac) present in the material per given weight;
  - (b) measuring the amount of Neu5Gc present in the material per given weight; and
  - (c) calculating the % Neu5Gc of the sample, wherein % Neu5Gc is determined using the formula:  $\% \text{ Neu5Gc} = [(\text{Neu5Gc}) / (\text{Neu5Ac} + \text{Neu5Gc})] \times 100$ .
2. The method of claim 1, wherein the biological material is a food sample.
3. The method of claim 2, wherein the food sample is a red meat or a dairy product.
4. The method of claim 2, further comprising the step of calculating the Neu5Gc content per serving by multiplying the amount of Neu5Gc in step (b) by a food serving size of a given weight.
5. The method of claim 1, wherein the biological material is a clinical sample.
6. The method of claim 5, wherein the clinical sample is from an animal source.
7. The method of claim 6, wherein the clinical sample is urine, tissue, blood or saliva.
8. The method of claim 5, wherein the tissue is suspected of being diseased.
9. The method of claim 5 further comprising the step of repeating steps (a) to (c) at more than one time period.
10. The method of claim 9, wherein the clinical sample is from a human or non-human animal subject, and wherein the subject undergoes a dietary change or therapy during the time period.

11. A method of purifying sialic acid-specific antibodies, comprising the steps of:
  - (a) preparing antibodies to sialic acids;
  - (b) contacting the antibodies from step (a) with a first solid phase to which a sialic acid having a side chain has been attached; and
  - (c) contacting the antibodies that bound to the first solid phase with a second solid phase to which the sialic acid without the side chain has been attached.
12. The method of claim 11, wherein the sialic acid having a side chain is selected from the group consisting of: N-acetylneuraminic acid, Ketodeoxynonulosonate, N-glycolylneuraminic acid, N-propanoylneuraminic acid, N-butanoylneuraminic acid, N-pentanoylneuraminic acid, N-hexanoylneuraminic acid, N-heptanoylneuraminic acid, N-oxooctanoylneuraminic acid, N-levulinolylneuraminic acid, N-homolevulinoylneuraminic acid, N-oxohexanoylneuraminic acid, N-oxoheptanoylneuraminic acid, and N-oxooctanoylneuraminic acid.
13. The method of claim 11, wherein the side chain is removed using periodate.
14. A method of detecting anti-Neu5Gc specific antibodies in a biological material comprising the steps of:
  - (a) determining the amount of anti-Neu5Ac antibodies present in the material using Neu5Ac as an antigen target;
  - (b) determining the amount of anti-Neu5Gc antibodies present in the material using anti Neu5Gc as an antigen target; and
  - (c) subtracting the amount of anti-Neu5Ac antibodies from the amount of anti-Neu5Gc antibodies to determine the amount of anti-Neu5Gc specific antibodies.
15. The method of claim 14, wherein step (a) and step (b) are performed in identical systems, except that in step (a), Neu5Ac is the antigen and in step (b), Neu5Gc is the antigen target.
16. The method of claim 15, wherein the biological material is a clinical sample.
17. The method of claim 16, wherein the clinical sample is from a human subject.

18. The method of claim 17, wherein the clinical sample is blood.
19. A composition comprising an affinity purified antibody specific for binding N-glycolylneuraminic acid (Neu5Gc).
20. A method for purification of antibodies specific to sialic acid groups comprising:
- (a) exposing an antibody containing solution to a first immobilized target that has a very low density of the sialic acid under conditions to allow antibody binding;
  - (b) challenging the bound antibodies with a second immobilized phase comprising the first immobilized phase treated with mild sodium periodate; and collecting the antibodies that do not bind to the second immobilized phase.
21. A method for the diagnosis of disease comprising:
- (a) collecting a serum or tissue sample from an individual;
  - (b) analyzing the sample for an elevated level of Neu5Gc specific antibodies in serum; and
  - (c) correlating an increased level of antibody with the presence of disease.